

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

No. 63. MARCH 1913.

XXVII.—*Descriptions and Records of Bees.*—I.
By T. D. A. COCKERELL, University of Colorado.

Trichocolletes venustus (Smith).

Three males before me with the following data: Toohey's Hill, Brisbane, Sept. 4, 1911 (*Hacker*; Queensl. Mus. 10); Stradbroke Island, Aug. 28, 1891 (*J. H. Boreham*; Froggatt coll. 202); Sydney, N.S.W. (*Froggatt*, 150).

The hitherto unknown female is represented by a specimen from Brisbane (*Hacker*; Queensl. Mus. 11), collected Sept. 12, 1911. It is less elongated than the male, with the light abdominal bands less distinct. The hair at end of abdomen is sooty, but light on middle of fifth segment. Mandibles red, except apically; face broad; clypeus shining, with strong scattered punctures; hair of face white, but golden on lower margin of clypeus and lower side of mandibles; the pale fulvous hair of vertex, mesothorax, and scutellum tipped with fuscous; scape black, red at base; flagellum obscure reddish beneath, but black basally and bright ferruginous apically; stigma obsolete; knees and tarsi ferruginous, so also tibiae to a considerable extent, but middle and anterior tibiae suffused or clouded with black behind, and the middle ones largely so in front and on outer side; hind tibiae red, with a plumose pale yellowish seopa, which is fuscous only at extreme base; hind spur pectinate with numerous very close-set long teeth, the effect rather like one side of a *Cycas* leaf.

In the obsolete stigma this resembles *Anthoglossa*, but the marginal cell is longer and the second s.m. is narrowed above. The eyes are hairy as in the male.

Paracolletes marginatus, Smith.

Victoria, Feb. 1901 (*C. F.*, Turner coll.) ; Cheltenham, Victoria, 1909 (*French* ; Froggatt coll.).

These are males, and are almost exactly like *T. venustus*, except that the eyes are entirely hairless, the first r. n. joins second s.m. well beyond the middle, and the abdominal segments have considerable black or dark fuscous hair above.

I take Smith's male (which bears the type label) as the type of *marginatus*. It seems very probable that *P. marginatus* arose as a mutation of *T. venustus*, but, according to the dates given, they fly at different times of the year, and presumably visit different flowers.

Paracolletes tuberculatus, sp. n.

♀.—Length about 11 mm.

Moderately robust; head and thorax entirely black; abdomen dark bluish green, with the hind margins of the segments, except the first, dark reddish; hair of head and thorax dull white, sooty on vertex (the scutellum in the specimen described is hairless). Legs black, with mostly pale hair, but it is shining red on inner side of anterior tarsi and reddish fuscous on inner side of the others; hind tibial scopa stained with fuscous behind and on outer side. Mandibles reddish apically; clypeus shining, with rather dense large punctures; flagellum obscurely reddish beneath except at base; front minutely and densely punctured, except the sides, which are broadly dullish, smooth, almost impunctate; mesothorax and scutellum finely and quite densely punctured; middle of mesothorax with a shining sparsely punctured area; scutellum depressed in middle; postscutellum with an obtuse median tubercle or very prominent angle; area of metathorax finely transversely striated, not carinate; punctures of mesopleura well separated; tegulae piceous and punctate in front, smooth and chestnut-red behind. Wings strongly suffused with reddish brown; stigma and nervures dark reddish; b. n. falling a little short of t.-m.; first r. n. joining second s.m. before the middle; third s.m. narrowed more than half above; hind spur with about five slender spines. Abdomen thinly clothed with pale hair, that at the apex dark fuscous.

♂.—Length about 10 mm.

With the usual sexual differences, but the postscutellum as in the female; sides of face densely covered with appressed silky white hair; cheeks beneath with very long white hair; femora beneath with long white hair, twice as long on the anterior ones as on the others; vertex and thoracic dorsum with sooty hair. Wings paler than in female, but very distinctly brownish; antennæ normal; fourth ventral segment with a very conspicuous and regular light golden hair-fringe.

Hab. Cheltenham, Victoria (*French*). The ♀ (=type) is 177 and the male 178 in the Froggatt collection.

Known by the tuberculate postscutellum, but otherwise closely allied to the *P. versicolor* group. From *P. tuberculatus*, *P. frontalis* (Sm.) differs by the smaller size, antennæ testaceous beneath, pale tibial scopa (shining golden above), and in the bright ferruginous mandibles of the male. The face of male *frontalis* is densely covered with hair; in male *tuberculatus* it is densely covered only at the sides. *P. versicolor* differs by the smooth and shining thorax, "with distant fine punctures," and the "silken gloss" of the abdomen. *P. providus* differs by the sparingly punctured thorax and the white tibial scopa. *P. obscuripennis* (♂) differs by the darker wings and the sparsely punctured mesothorax (this is, however, more sparsely punctured in ♂ than ♀ *tuberculatus*); also in the venation and the base of the metathorax.

Paracolletes tuberculatus insularis, subsp. n.

♀.—A little smaller and less robust than the type; underside of labrum with much copper-red hair; mesothorax more shining and less densely punctured; area of metathorax with the transverse striæ feeble, scarcely evident; thorax above with some dark hair; first abdominal segment more sparsely, feebly punctured; hind tibial scopa with black hair behind to apex; hair on inner side of hind basitarsi fuscous. The postscutellar tubercle, though short, is quite sharp.

Hab. Stradbroke Island, Queensland, Oct. 2, 1911 (*Hacker*; Queensl. Mus. 15).

The hair on the under side of the abdomen is white, not pale yellow as in *P. versicolor*.

Paracolletes truncatulus, sp. n.

♀.—Length about 9 mm.

Head and thorax black, abdomen clear red, with a pyri-

form black spot on each side of second abdominal segment ; hair of head and thorax dull white, partly fuscous on thoracic dorsum ; head broad ; clypeus shining, with sparse irregular, partly elongate, punctures ; sides of face with conspicuous white hair ; antennæ dark, flagellum very obscurely brownish beneath except at base ; mesothorax with a minutely tessellate surface but shining, with small scattered punctures ; scutellum shining, with sparse but very distinct punctures ; base of metathorax with a moderately salient transverse ridge, above which the surface is shining ; tegulæ reddish testaceous, dark in front. Wings dusky hyaline, the nervures and quite large stigma dark ferruginous ; marginal cell elongate, obliquely truncate at end and slightly appendiculate ; b. n. meeting t.-m. a little on the outer side ; second s.m. narrowed above, receiving the first r. n. near the end ; second r. n. meeting third t.-c. Legs reddish black, the anterior tibiæ bright red in front ; hind tibial scopa with fuscous hair above toward base ; hair on inner side of hind basitarsus pale yellowish. Abdomen without bands, the hair at apex very pale brownish or brownish white.

Hab. Blackwood, Australia, Oct. 16, 1891 (*Froggatt*, 168).

Related to *P. rubellus* (Sm.), but the nervures are not testaceous and the apex of the abdomen is neither dark in hair nor tegument. It has a close superficial resemblance to *Andrena sphecodina*.

Paracolletes platycephalus, Cockerell.

This was described from two females. I have before me a male from Windsor, Victoria (*French* ; *Froggatt* coll. 180). It differs from the female in the usual manner, but also in having the hair of the face and thorax above pale ochreous, becoming a warm reddish on scutellum, but without fuscous ; supraclypeal area and mesothorax dull, opaque ; scutellum somewhat shining ; first two abdominal segments, seen from in front, with a beautiful purple lustre ; pale golden hair on apical part of abdomen. Antennæ long and dark, the flagellum conspicuously moniliform.

Paracolletes maorium, sp. n.

♀.—Length 11 mm. or slightly more.

Rather robust ; head, thorax, and legs black ; abdomen very dark blue-green, the hind margins of the segments rufous ; hind part of cheeks, and thorax below, with quite abundant long white hair ; on occiput, middle of face, and sides of thorax it is also white, with a slight creamy tinge,

but on front (going lower down at sides), vertex, mesothorax (except in front), and scutellum it is dark fuscous ; mandibles red at extreme tip ; clypeus shining, sparsely punctured, with a U-like depression enclosing a raised, smooth, ridge ; middle of supraclypeal area shining, with a row of punctures ; flagellum obscure brown beneath ; mesothorax and scutellum brilliantly shining, with sparse feeble punctures ; area of metathorax smooth, with a longitudinal median depression, a transverse impressed line running close to the base, and a slight one below that, broadly failing in middle ; the large scopula of hind tibia creamy white except at extreme base, where it is fuscous ; hair on inner side of basitarsi shining red ; hind spur apparently simple, but the compound microscope shows it to be minutely ciliate ; tegulae piceous. Wings dusky, the large stigma and the nervures dark reddish ; b. n. moderately arched, falling just short of t.-m. ; second s.m. narrowed above, receiving first r. n. before the middle ; third s.m. elongated, narrowed more than half above, receiving second r. n. about half as far from end as first r. n. is from base of second s.m. Abdomen shining, without hair-bands, its apical hair dense and black.

Hab. New Zealand, 1909 (*French*, Froggatt coll. 99).

Related to *P. confusus* (Ckll.) and *P. imitatus* (Sm.), but distinguished by its rather large size, with dark hair on head and thorax above. Distinctive characters are also found in the metathorax and hind spur. It is also related to *P. metallicus* (Sm.), differing in the colour of the hair and in the venation.

Paracolletes incanescens, sp. n.

♀.—Length about 11 mm.

Robust, shining pure black ; head and thorax very hairy, the hair mostly dull white, but dark fuscous on vertex, upper edge of front, mesothorax except in front and more narrowly behind, scutellum and upper part of mesopleura ; mandibles dark red at apex ; tongue very broad, the emargination slight ; head broad ; flagellum red at apex ; clypeus shining, sparsely punctured, with a round flattened, even slightly concave disc, across which runs a median obtuse ridge, more or less continued on to the shining supraclypeal area ; mesothorax and scutellum with evident but shallow punctures, not dense ; area of metathorax brilliantly shining, with a very obtuse transverse ridge ; tegulae piceous. Wings faintly dusky ; stigma and nervures fusco-ferruginous, the stigma redder than the nervures ; b. n. meeting t.-m. ; first r. n. joining second s.m. a little before middle ; second r. n. joining third

s.m. very near the end ; third s.m. broad above, not greatly elongated ; hair of femora dull white, of tibiæ and tarsi fuscous, red on inner side of anterior tibiæ ; tibial scopa dark fuscous ; hind spur with few long slender teeth (long-pectinate). Abdomen shining, without hair-bands, the dense hair at apex black ; dorsal surface of abdomen with small but very distinct punctures, especially dense on basal two-thirds of second segment.

♂.—Length 9 mm.

Much smaller and less robust than the female, but structurally similar ; face with thin white hair, not at all concealing surface of clypeus ; flagellum entirely black ; vertex black-haired, but the dark hair of thorax above much less conspicuous than in the female ; apical half of hind tibiæ dark chestnut-red ; hind tarsi pale ferruginous. Flagellum moniliform.

Hab. Female (= type) from Stradbroke Island, Queensland, Oct. 2, 1911 (*Hacker* ; Queensl. Mus. 13). Male from Brisbane, April 1, 1912 (*Hacker* ; Queensl. Mus. 58).

Related to *P. punctatus* (Sm.) and *P. obscurus* (Sm.). From *P. punctatus* (♀) it is known by the larger size and largely black or dark fuscous hair of head and thorax. From *P. obscurus* it differs by the smooth sparsely punctured clypeus and the colour of the tibial scopa. The male is very like that of *P. thornleighensis*, Ckll., differing by the larger size, the thin white hair of face, the black flagellum, the ferruginous tibial spurs, and the white hair of abdominal dorsum extending only to middle of second segment, beyond which it is short, sparse, and black.

Paracolletes thornleighensis, Cockerell.

Two males (*Froggatt*, 159) from Thornleigh, N.S.W., 1890-91, show that this species has a distinctly bluish abdomen. The colour is so faint in one of them that I placed it, as I did the type, among the species without metallic tints. The legs are dark reddish to black. Among Smith's species *P. thornleighensis* is nearest to *P. providus*, from which it is known (♂) by the dark hair of thorax above. The brilliantly shining area of metathorax separates it at once from *P. providellus*, Ckll.

The specimen which carries the number 159 also carries a number 30 ; the original types were marked by the same collector 32, so I infer that he regarded the specimens with evidently bluish abdomens as distinct. It is perhaps possible that there are two species, but with the evidence before me I cannot well separate them.

Paracolletes euphenax, sp. n.

♂.—Length 8 mm.

Black, looking just like *P. incanescens* ♂, but abundantly distinct by the following characters:—Face and front densely covered with long cream-coloured hair; flagellum hardly moniliform; mandibles broadly red at apex; hair of head above entirely creamy white, though that of mesothorax and scutellum is dilute brownish; hair of metathorax very long and abundant; abdomen dullish, without evident punctures, and with more and longer hair. Wings considerably shorter; marginal cell longer, more produced apically; b.n. falling short of t.-m.; third s.m. longer, more narrowed above. Anterior tibiæ and tarsi bright ferruginous, with a large black stain behind; the other tibiæ and tarsi black, the last tarsal joint red; middle knees red. On the venter of the abdomen the fourth and fifth segments are broadly fringed with orange-ferruginous hair.

Hab. Brisbane, Queensland, Sept. 4, 1911 (*Hacker*; Queensl. Mus. 12).

I thought at first that this might possibly be the male of *P. advena* (Sm.), but I believe it is distinct. The abdominal hair-bands of *P. advena* are wholly wanting.

Paracolletes fervidus subdolosus, subsp. n.

♀.—Length a little over 12 mm.

Differing from Smith's description of *P. fervidus* by the strong intermixture of fuscous hair on vertex, mesothorax, and scutellum; the anterior tibiæ bright clear red in front; hair on outer side of anterior tibiæ dull white, of the middle tibiæ dark fuscous, and the hind tibial scopa with a very broad fuscous-black band behind; hair on inner side of posterior tibiæ light ochraceous, of their basitarsi red-golden in front and whitish posteriorly. Wings evidently dusky. Apex of abdomen thickly clothed with greyish-chocolate coloured hair, with ochreous hair on each side of fifth segment, contrasting.

This ought perhaps to stand as a distinct species, *P. subdolosus*, but it must at least be very close to *P. fervidus*. The flagellum is red beneath (except at base), as Smith described for *fervidus*; my notes on Smith's type state that the antennæ are dark, but I now think this was a mistake, due to not looking sufficiently beneath. The broad, shining, well-punctured abdomen of *subdolosus* would at first sight be called black, but it is in fact *very* faintly æneous, with the broad hind margins of the segments dark reddish, exactly as

described for *fervidus*. The first r. n. in *fervidus* enters the second s.m. about the middle; in *subdolos* a little before the middle. Other characters of *subdolos* are: b.n. meeting t.-m.; third s.m. very broad above, receiving second r.n. some distance before the end; clypeus with strong, largely confluent punctures of various sizes; face with pale fulvous hair; mesothorax with large strong punctures, sparse in middle; area of metathorax shining, with a strong and sharp transverse keel, the channel above which is crossed by raised lines or ridges as in species of *Colletes*; the margin of the area is finely striate; tegulæ rufo-piceous; hind spur long pectinate, the teeth numerous but well apart; tubercles with bright orange-fulvous hair.

Hab. Cheltenham, Victoria (*French*; Froggatt coll. 175).

Paracolletes gallipes, sp. n.

♀.—Length about 11 mm.

Rather slender, black and clear ferruginous red; head seen from in front broad, squarish, black, with the clypeus, supraclypeal area, mandibles (except at apex), and labrum dark red, the lower margin of the clypeus broadly chestnut-red; clypeus and supraclypeal area shining, with coarse irregular punctures, the middle of the clypeus with a smooth raised line; mandibles broad, with a short inner tooth; cheeks small; antennæ light ferruginous, the scape darker and suffused with black; face, except clypeus, densely covered with very pale ochreous-tinted hair; cheeks and occiput with similar hair; thorax also densely covered with pale hair, strong clear ochreous above; thorax black, with the prothorax, scutella, metapleuræ, and metathorax ferruginous; mesothorax shining, with strong punctures, widely scattered in middle; area of metathorax short, concave, smooth and shining; posterior face of metathorax vertical; tegulæ small, light testaceous. Wings hyaline, unusually pointed, almost subfalcate, apically; nervures and the small stigma ferruginous; marginal cell subtruncate at apex; b. n. very straight, almost reaching t.-m.; second s.m. quite large, nearly square, receiving first r. n. very near its base; third s.m. large, broad above. Legs clear ferruginous, with pale hair, that on hind legs abundant, reminding one of the condition in certain fowls. Abdomen rather long and narrow, clear ferruginous, shining, with feeble minute punctures, the apical margins of the segments broadly depressed and pale testaceous; the abdomen has the usual long hair on first segment, short pale hair thinly covering the basal halves of

segments 2 to 4, rather long hair on the depressed apical parts; on fifth segment and apex a thick fringe of very pale brownish hair, but at sides of apex the hair is almost white; pygidial plate large, triangular, obtuse at end. Mouth-parts Colletiform as usual; last two joints of both labial and maxillary palpi very slender, the penultimate joint of labial palpi produced at end beyond the insertion of last joint.

Hab. Poonarunna, S. Australia (Nat. Mus. Victoria, 109).

A very singular species, not closely allied to any of those previously described. It will be readily known by its pointed wings and unusual venation. When the male is known it may be necessary to propose a new generic name.

Paracolletes melbournensis, Ckll.—Victoria, Sept. 1901 (C. F.; Turner coll.). Variety (♀) with red tarsi: Sydney, N.S.W., Nov. 29, 1910 (Froggatt, 125).

P. turneri, Ckll.—Kelvin Grove, Brisbane, Nov. 27, 1911 (Hacker; Queensl. Mus. 8).

P. advena (Sm.).—Sunnybank, Brisbane, Sept. 12, 1911 (Hacker; Queensl. Mus. 14).

P. carinatus (Sm.).—Bathurst, N.S.W., Feb. 16, 1912 (Froggatt, 147); Nagambie, Victoria, 1909, male (French; Froggatt coll. 80).

Euryglossa hæmatura, Ckll.—Brisbane, Queensland, Dec. 11, 1911, ♀ (Hacker). In better condition than the type; the abdomen shows broad reddish bands, interrupted in middle, on hind margins of second and third segments, and a very broad entire rust-red band on hind margin of fourth.

E. subsericea, Ckll.—Kelvin Grove, Brisbane, Nov. 27, 1911 (Hacker).

E. reginæ, Ckll.—Kelvin Grove, Brisbane, Nov. 27, 1911 (Hacker).

E. neglectula, Ckll., var. *a*.—A little smaller than the type, with red anterior tibiæ, middle tibiæ red in front, hind tibiæ red at base and largely so in front. Kelvin Grove, Brisbane, Jan. 15, 1912 (Hacker).

Callomelitta picta, Sm.—Magnet, Tasmania (Lea).

Prosopis elegans, Sm.—Kelvin Grove, Brisbane, Nov. 27, 1911 (*Hacker*).

P. chrysognatha, Ckll.—Stradbroke Island, Oct. 2, 1911 (*Hacker*).

P. aureomaculata, Ckll.—Kelvin Grove, Brisbane, Jan. 15, 1912 (*Hacker*).

P. aureomaculata subnubilosa (Ckll.).—Stradbroke Island, Oct. 2, 1911 (*Hacker*).

Allodape simillima, Sm.—Brisbane, Sept. 4, 1911 (*Hacker*).

Bombus trifasciatus, Smith.

In the course of some work on Asiatic *Bombi* I came to seriously doubt the identity of Bingham's Indian "*trifasciatus*" with the genuine species of that name described by Smith from China. Mr. Meade-Waldo has kindly examined the specimens in the British Museum, with the result of abundantly confirming my doubts. His report is as follows:—"We have two specimens labelled '*Bombus trifasciatus*, Sm.,' by Bingham among his Sikkim material. The exact locality was 'Lintu, Sikkim, 12,500 ft.' We have also got a specimen in very poor condition, but agreeing with them in every respect, from some other source, but with locality 'Sikkim,' from coll. Schlagintweit. I have compared these specimens with true Chinese *trifasciatus* (Smith's type)—all Smith's series is 'Shanghai.' I find that the fourth antennal joint of Smith's type is *very short*, broader than long, whereas the corresponding joint in the Sikkim insects is certainly longer than broad. They have a very different appearance as well. The Chinese insect has a much more *tidy* appearance, the pubescence is shorter and more velvety; in Sikkim specimens it is long and irregular. The colour, too, is different; the black band on Sikkim specimens is much reduced. I do not notice much or any difference in the malar space of the two forms." (*Litt.*, Dec. 6, 1912.)

I possess a Chinese co-type of *B. trifasciatus* from F. Smith's collection; it has the characters indicated by Mr. Meade-Waldo. I also possess a specimen, labelled "Sikkim (*Bingham*)," from the Berlin Museum, and it is evidently Bingham's so-called *trifasciatus*. So far as I can at present determine, it has the characters of *B. pyropygus*,

Friese, found in arctic Siberia. *B. bizonatus*, Sm., is a superficially similar insect, but is easily separated by the entirely black hair of the face and vertex. The malar space also is considerably shorter in *bizonatus* than in the Sikkim so-called *trifasciatus*. I have no authentic *pyropygus*, but I have *B. kirbyellus*, Curtis, of which Friese considers *pyropygus* a subspecies, and on close comparison it seems to agree structurally with the Sikkim bee. It seems therefore that we may safely add *B. pyropygus* to the fauna of the Himalayas—a very interesting extension of range. We have indeed a somewhat parallel case in America, for a male of the arctic *B. kirbyellus* (det. Franklin) was taken by my wife in the arctic-alpine zone on the Truchas Peaks, New Mexico.

Cælioxyys grindeliæ, Cockerell.

Santa Fé, New Mexico, Aug. 2, 1912, 2 ♂ (*Cockerell*).

I have described the fourth ventral segment as entire, but the smooth median space is bounded on each side by a tooth, and if the segment is looked at from in front these teeth appear prominent, the interval between them becoming a shallow emargination. In *C. ribis kincaidi* the middle of the apical margin of the fourth segment is truncate, without any teeth.

Cælioxyys ribis, Cockerell.

Nova Scotia, ♀ (F. Smith's collection; British Museum).

This agrees with a specimen from Beulah, New Mexico, except that the apical part of the fourth ventral segment is quite closely beset with minute punctures, whereas in New Mexico *ribis* these punctures are much less evident and more nearly confined to the margin of the segment. With only a single specimen it cannot be determined whether there is a Nova Scotian race, distinguished by the character indicated.

XXVIII.—On the Geographical Races of *Vipera ammodytes*.
By G. A. BOULENGER, F.R.S.

(Published by permission of the Trustees of the British Museum.)

[Plate V.]

ON two previous occasions* I have briefly dealt with the varieties of *Vipera ammodytes*, and expressed my regret at

* Proc. Zool. Soc. 1903, i. p. 185, and Ann. & Mag. Nat. Hist. (7) xiv. 1904, p. 134. These papers have been entirely overlooked by Dr. E. Schreiber in his second edition of the 'Herpetologia Europea' (1912).